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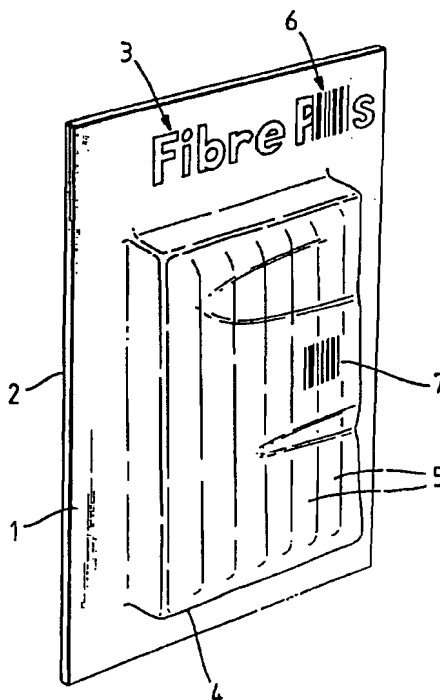
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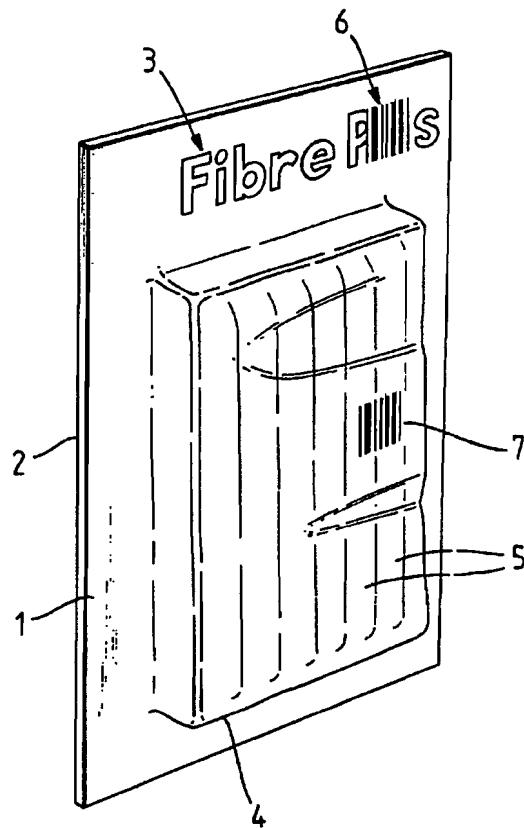
## (54) Bar code printing

(57) A method of bar code printing is disclosed which is characterised in that the bar code is printed directly onto packaging material associated with the product, and in that the ink used to produce the bar code is such that indicia constituting the bar code can be discriminated regardless of the background onto which the bar code is printed. The printed indicia may have a distinctive reflective character w.v.t. the substrate (i.e. matt indicia on glossy substrate, or vice versa); or may possess distinctive I.R. or U.V. properties; or the code bars and the spaces therebetween may both be printed but in contrasting colours.



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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1                    BAR CODE PRINTING

                  This invention relates to bar code printing.

                  Bar codes are now widely used for ready  
5 identification of products at goods-in and check-out  
locations associated, for example, with retail trading.  
They facilitate the use of fully automatic in-and-out  
systems and, in some instances, do away with the need for  
price labels on the products. Many supermarkets stock  
10 25,000 to 30,000 items for sale, however, and do not have  
sufficient shelf space to allocate all of these items to  
a particular position; as a result, even if there is a  
bar code on such products, there is still a need for  
price marking. Nevertheless, the use of a bar code  
15 scanning system to identify the goods may reduce labour  
requirements significantly and thus produce considerable  
savings.

                  In supermarkets, typically 95 - 96% of food items  
going through the check-out have a bar code already  
20 printed at source by the manufacturer. For non-food  
items, the number of products bar coded at source is  
typically 80 - 85% of those going through the check-out.

                  In order to apply price labels to items already  
carrying a bar code, and to add a bar code to those  
25 products which are not coded at source, it is common for  
a retail outlet to use one or more label printers. These  
may be hand-held or fixed in position. Typically, three  
stationary printers may be used by up to ten people.  
Strips of labels will be printed and taken to the product  
30 and either applied by hand or with a dispenser. Some  
retailers consider that it is more economical for each  
operative to have his own hand-held bar code label  
printer.

                  If a national bar code has been allocated to a  
35 given product, this will normally be used by the retailer  
if no manufacturer's bar code is present. For products  
where no such national bar code has been allocated, it is

1 up to the retailer to decide on his own bar code number.  
Typically, this number might be based on the numbering  
system used by the retailer before the introduction of  
bar code scanning to his store. In practice, the person  
5 generating bar codes with a printer will have with him  
source material which indicates the nature of the bar  
code for each product where a label is required.

Hand-held labelling machines typically comprise a  
housing which is arranged to store a label supply roll; a  
10 printing unit; and a keyboard for inputting data. When  
such a machine is used to print bar code labels, an  
operative will input the bar code number via the  
keyboard, which then activates a label feed mechanism and  
the printing unit to apply the requested bar code to one  
15 of the labels on the supply roll. After the bar code has  
been printed, the label feed mechanism moves the supply  
roll so that the printed label is accessible for  
application to the appropriate goods item.

Packaging materials vary widely in the nature of  
20 the material from which they are fabricated, in  
background colour and in finish. Current bar codes are  
in the form of black indicia on a white background.  
These factors encourage the use of labels which provide a  
background which is uniform in quality and colour.

25 While the use of labels as a vehicle to carry bar  
codes is, in many instances, convenient and effective,  
nevertheless there are certain situations in which this  
standard technique causes problems. For example, many  
items are packaged in small units with substantially all  
30 of their exterior surface carrying graphics displays and  
consumer information. In such cases, the application of  
a label may obscure data which is intended to be  
displayed. Printing a bar code onto a label necessitates  
transfer of the label to the goods; when dealing with a  
35 large volume of products, the label transfer step makes a  
significant contribution to the overall time involved in  
the labelling exercise, and consequently contributes to

1 the overall cost involved in generating and applying bar  
code labels.

We have perceived that there is a need for a  
system which permits bar codes to be printed directly  
5 onto product packaging without using an adhesive label as  
an intermediate support. Accordingly, the present  
invention provides a method of applying a bar code to a  
product, characterised in that the bar code is printed  
directly onto packaging material associated with the  
10 product, and in that the ink used to produce the bar code  
is such that indicia constituting the bar code can be  
discriminated regardless of the background onto which the  
bar code is printed.

In one embodiment, a matt ink is used to generate  
15 bar code indicia, and the bar code is printed directly  
onto a glossy area of packaging material. In this way,  
the matt ink provides a machine-detectable reflective  
contrast between indicia of the bar code regardless of  
any change in ground colour of the packaging. A variant  
20 of this embodiment is to use a gloss ink on a matt  
multi-coloured area of packaging material.

To facilitate generation of direct bar codes in  
the embodiment discussed above, a bar code printer may be  
used which is capable of measuring the mean albedo of an  
25 area of packaging material and to select matt black or  
gloss black ink according to this measurement.

In another embodiment, the ink used to generate  
bar code indicia possesses chromaticity at the extremes  
of the visible spectrum or in the infra-red or  
30 ultra-violet regions of the spectrum. In this  
embodiment, the "colour" of the ink is either invisible  
to the human eye or (by virtue of its being at the  
extremes of the visible spectrum) is barely  
distinguishable over the background colour of the  
35 packaging material.

In a third embodiment of the invention, a bar code  
application unit is used which is capable of printing two  
distinct colours - for example, black and white - so that

1 the colour of the packaging material onto which the bar  
code is directly printed does not affect readability of  
the bar code. This may be useful where the packaging  
material is transparent.

5 In all of the embodiments described above, direct  
bar code printing is beneficial since the location of the  
bar code in relation to the packaging material does not  
need to be carefully selected.

For a better understanding of the invention, and  
10 to show how the same may be carried into effect,  
reference will now be made, by a way of example, to the  
accompanying drawing which illustrates the application of  
bar codes to a pack of fibre pens.

Referring to the drawing, a pack 1 comprises a  
15 backing material 2 carrying identification printing 3 and  
covered with a bubble pack 4 within which fibre pens 5  
are retained. For purposes of illustration, the location  
of two bar codes 6 and 7 is shown in the drawing. Bar  
code 6 is positioned over the printing 3, and is  
20 machine-readable despite the varying contrast and/or  
colours of the background. Bar code 7 is printed  
directly onto the transparent surface of bubble pack 4,  
and again can be read by machine regardless of the nature  
of the surface onto which it is applied and regardless of  
25 any colours and/or contrast edges behind the transparent  
surface. Although for ease of depiction the bar codes 6  
and 7 are shown as optically dense regions, it will be  
appreciated that the visual impact of the bar codes may  
be minimal. For example, bar code 6 could be generated  
30 using infra-red-absorptive ink which would not obscure  
the printing over which it was applied. To enable a  
sales assistant to determine the location of such an  
"invisible" bar code, a prearranged location may be  
agreed as a standard location for the product in  
35 question, or the bar code may be accompanied by a  
location symbol, for example a white dot.

The bar code 7 may be formed by use of black and

1 white inks to generate the bar code indicia. With a  
location such as that indicated for bar code 7,  
obliteration of material behind the bar code is not of  
particular importance.

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1 CLAIMS:

1. A method of applying a bar code to a product, characterised in that the bar code is printed directly  
5 onto packaging material associated with the product, and in that the ink used to produce the bar code is such that indicia constituting the bar code can be discriminated regardless of the background onto which the bar code is printed.

10 2. A method according to claim 1, wherein the ink used to generate bar code indicia possesses chromaticity at the extremes of the visible spectrum or in the infra-red or ultra-violet regions of the spectrum.

15 3. A method according to claim 1, wherein a bar code application unit is used which is capable of printing two distinct colours.

4. A method of applying a bar code to a product, substantially as hereinbefore described with reference to, and as illustrated in, the accompanying drawings.

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